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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,518	06/27/2001	Robert William Dixon	STL9981/40046.155USU1	5994
26195	7590	12/06/2004	EXAMINER	
FISH & RICHARDSON P.C. 3300 DAIN RASCHER PLAZA 60 SOUTH SIXTH STREET MINNEAPOLIS, MN 55402			CHEN, ALAN S	
			ART UNIT	PAPER NUMBER
			2182	

DATE MAILED: 12/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/894,518

Applicant(s)

DIXON, ROBERT WILLIAM

Examiner

Alan S Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-9,11-17 and 19-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,3-9,11-17 and 19-24 is/are allowed.
- 6) ☒ Claim(s) 25-56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. Claim 28 is objected to because of the following informalities: line 2, insert "of" after word "function". Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 25-56 rejected under 35 U.S.C. 102(e) as being anticipated by No. 6,405,256 to Lin et al. (hereafter Lin).

~~4. As per claims 25, 45 and 49 Lin discloses a method, computer program product and~~  
system of allocating a buffer to handle a data stream (Fig. 2, caching servers handle downstream data stream by an expandable buffer, the method comprising: determining a buffer size for each data stream based on data rate information (Fig. 4, elements 210 and 224, buffer size is expanded or decreased based on the increase or decrease of transfer rate) associated with the data stream; and allocating space in the buffer to each of the data streams according to the determined buffer sizes (determined buffer sizes are fixed sizes to increase or decrease buffer based on data rate, Fig. 4, elements 212 and 225 and Column 8, lines 46 to 62). Note, Lin discloses that each expandable buffer is capable of handling a plurality of data streams in Column 8, line 54-Column

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9, line 4, with respect to being able to give buffer space to other expandable buffers in the cache server in order to help handle their data streams.

5. As per claims 26, Lin discloses the method of claim 25, wherein the data rate at which a data stream is received into the buffer is different than the data rate at which that data stream is sent out of the buffer (this is inherent in Lin since network congestion in a caching server is due to the disparity of the outgoing data and the incoming data, thereby forcing the action to increase or decrease the buffer size).

6. As per claims 27-29, 46, 47, 50, 51, 53 and 54, Lin discloses the method of claims 25, 45, 49 and 52 wherein determining the buffer size for each data stream further comprises a function of the data rate at which the buffer sends and/or receives each data stream (the buffer size is a function of whether the data rate has been increased or decreased, Fig. 4, elements 210, 224, 216, signaling the decrease or increase of the buffer size, Fig. 4, elements 212 and 225; note that it is a function sending as well as shown in Fig. 4, element 216 since the cache server tells the other cache server whom it is receiving data to stop data transfer).

7. As per claims 30-33, Lin discloses receiving a request to change the data stream (data rates) being handled by the buffer (Fig. 4, elements 212 and 225), determining buffer size based on data rate (Fig. 4, elements 210 and 224) and determining whether the total buffer sizes is large than available buffer space (Column 8, lines 55-Column 9, line 5). In addition, Lin discloses if the buffer space is too small, the data rate of the sending server is reduce (e.g., ceased, Column 9, lines 1-5).

8. As per claim 34, Lin discloses a method of allocating a buffer to handle one data stream (Column 4, lines 39-59, specifically lines 45-48 where each caching server can accommodate

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one data streaming transaction for each configured expandable buffer), the method comprising: receiving a request to change the data streams being handled by the buffer (Fig. 4, lines 210 and 224)); determining a buffer size for each data stream based on data rate information associated with the data streams that the buffer would handle after the requested change takes effect (Fig. 4, element 212 and 225); determining whether the sum of the determined buffer sizes is larger than the available space in the buffer (Fig. 4, element 214 and 226); and if the sum of the determined buffer sizes is not larger than the available space in the buffer, then allocating space in the buffer according to the determined buffer sizes for each of the data streams that the buffer will handle after the requested change takes effect (can continue allocating buffer space based on if network congestion has not subsided, Fig. 4, element 222).

9. As per claim 35, Lin discloses claim 34, wherein the buffer sizes for each data stream are determined before the requested change takes effect (the buffers have an initial size prior to being increased or decreased in size, Column 7, lines 27-45).

10. As per claim 36 and 37, Lin discloses claim 34, wherein the received request comprises a request to increase the number of data streams handled by the buffer (Fig. 4, element 224, increase stream rate).

11. As per claim 38-40, Lin discloses claim 34, wherein if the sum of the determined buffer sizes is larger than the available space in the buffer, then increasing the available space in the buffer by decreasing data rate associated with incoming data stream (Fig. 4, element 210 and 212). Lin also discloses the ability to use unallocated memory and/or borrow memory from other expandable memories within a cache server (Column 4, lines 50-60), e.g., borrow from other data streams being handled by the cache server.

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12. As per claims 41-44, Lin discloses claim 34, wherein determining the buffer size for each data stream comprises evaluating a function (whether to increase or decrease) of the data rates at which the buffer would receive and/or send the data stream if requested change takes effect (Fig. 4, elements 210, 216 and 224).

13. As per claim 48, Lin discloses claim 45, further comprising receiving a request to change the data streams (stream rate) being handled by the buffer (Fig. 4, elements 210 and 224); determining a second buffer size (e.g., one that is different than the present buffer size, such as one that is expanded) for the data stream based on data rate information associated with the data streams that the buffer would handle after the requested change takes effect (Fig. 4, element 212 and 225); determining whether the sum of the determined second buffer sizes is larger than the available space in the buffer (Fig. 4, element 214 and 226); and if the sum of the determined buffer sizes is not larger than the available space in the buffer, then allocating space in the buffer according to the determined buffer sizes for each of the data streams that the buffer will handle after the requested change takes effect (can continue allocating buffer space based on if network congestion has not subsided, Fig. 4, element 222).

14. As per claim 52, Lin discloses a data handling system (Fig. 1), comprising a buffer to handle data streams (Fig. 1, element 126); a processor coupled to the buffer (Fig. 1, element 127) and a memory containing a program instructions that, when executed by the processor cause the processor to perform operations to allocate available space in the buffer among data streams (Column 4, lines 5-10 and Column 8, lines 20-30, processor handles the execution of operations shown in Fig. 3 and 4), the operations comprising: determining a buffer size for each data stream based on data rate information (Fig. 4, elements 210 and 224, buffer size is expanded or

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decreased based on the increase or decrease of transfer rate) associated with the data stream; and allocating space in the buffer to each of the data streams according to the determined buffer sizes (determined buffer sizes are fixed sizes to increase or decrease buffer based on data rate, Fig. 4, elements 212 and 225 and Column 8, lines 46 to 62).

15. As per claim 55, Lin discloses claim 52, wherein the buffer is structured and configured to handle data streams between a source device (Fig. 2, element 100) and a receiver device (Fig. 2, element 120).

16. As per claim 56, Lin discloses claim 52, the operations further comprising receiving a request to change the data streams being handled by the buffer (Fig. 4, element 224); determining a second buffer size for the data stream based on data rate information associated with the data streams that the buffer would handle after the requested change takes effect (Fig. 4, element 225); determining whether the sum of the determined second buffer sizes is larger than the available space in the buffer (Fig. 4, element 214, e.g., on the second iteration); and if the sum of the determined buffer sizes is not larger than the available space in the buffer, then allocate space in the buffer according to the determined buffer sizes for each data stream that the buffer will handle after the requested change takes effect (Fig. 4, element 224, continue allocate enough space in buffer to handle data stream).

***Allowable Subject Matter***

17. Claims 1,3-9, 11-17 and 19-24 allowed.

The following is the statement of reasons for the indication of allowable subject matter: The prior art disclosed by the applicant and cited by the Examiner fail to teach or suggest, alone or in combination, a method or disc drive for handling multiple data streams in a disc drive

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comprising allocating buffer size required by each data stream being handled, wherein the allocation comprises scaling a host data rate for each data stream by a mathematical expression for a total time to fill or empty the buffer size allocated to all the data streams being handled to create a set of simultaneous equations for the buffer sizes; and solving the simultaneous equations to find the buffer size to be allocated for each data stream.

### ***Conclusion***

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to dynamic allocation of buffer space:

U.S. Pat. No. US 6,515,963 to Bechtolsheim et al.

U.S. Pat. No. US 5,583,792 to Li et al.

U.S. Pat. No. US 5,812,775 to Van Seters et al.

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19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan S Chen whose telephone number is 571-272-4143. The examiner can normally be reached on M-F 8:30am - 5:30pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A Gaffin can be reached on (571) 272-4146. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ASC  
11/26/2004



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